Water Conditions Summary

Operations Control, Engineering & Vegetation Management Department

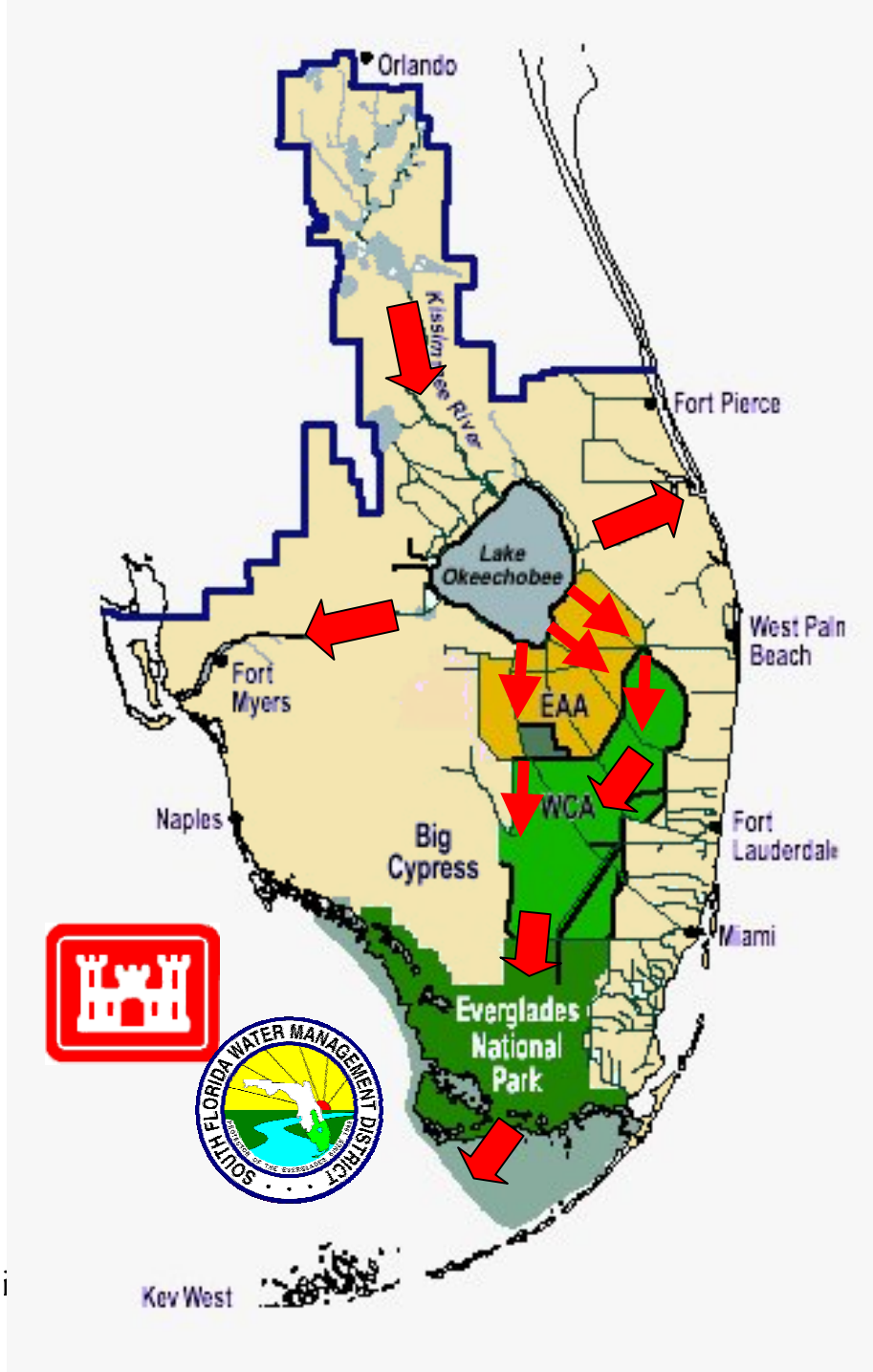
Operations & Maintenance Resource Area

Governing Board Presentation

January 9, 2003

The Central and Southern Florida Project

- Current operations are being regionally influenced by above average rainfall across the District



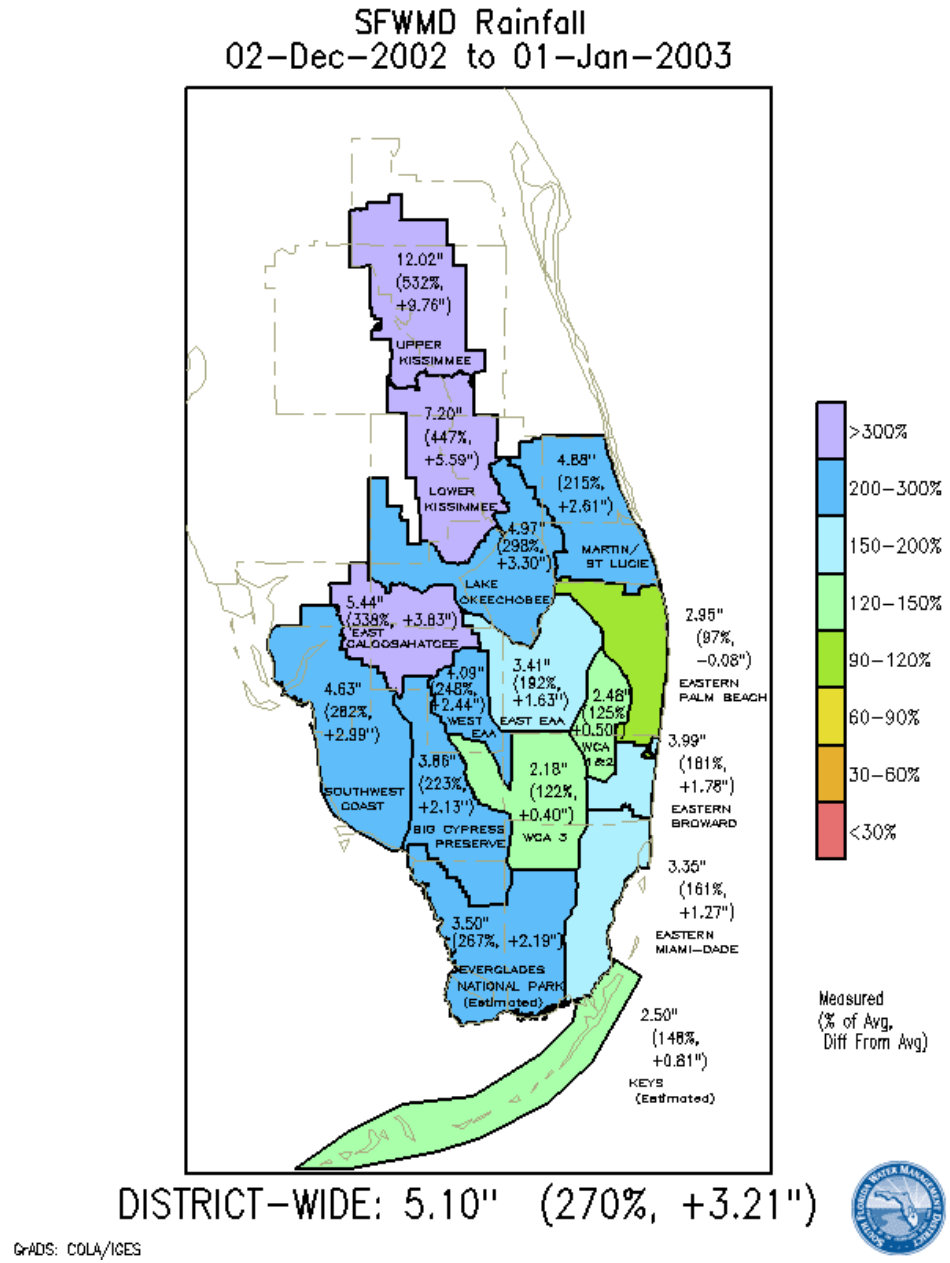
Meteorological Conditions

Governing Board Presentation - January 9, 2003

Meteorological Conditions

- December Rainfall : District-wide rainfall was 269% of average
  - Normal Rainfall: 1.89 inches
  - Actual Rainfall: 5.08 inches
  - Est. Pan Evaporation: 3.00 inches
- January Rainfall : To-date District-wide rainfall is 48% of average

- Most areas of the District received above average rainfall in December
- Kissimmee basins received near record high rainfall for the month

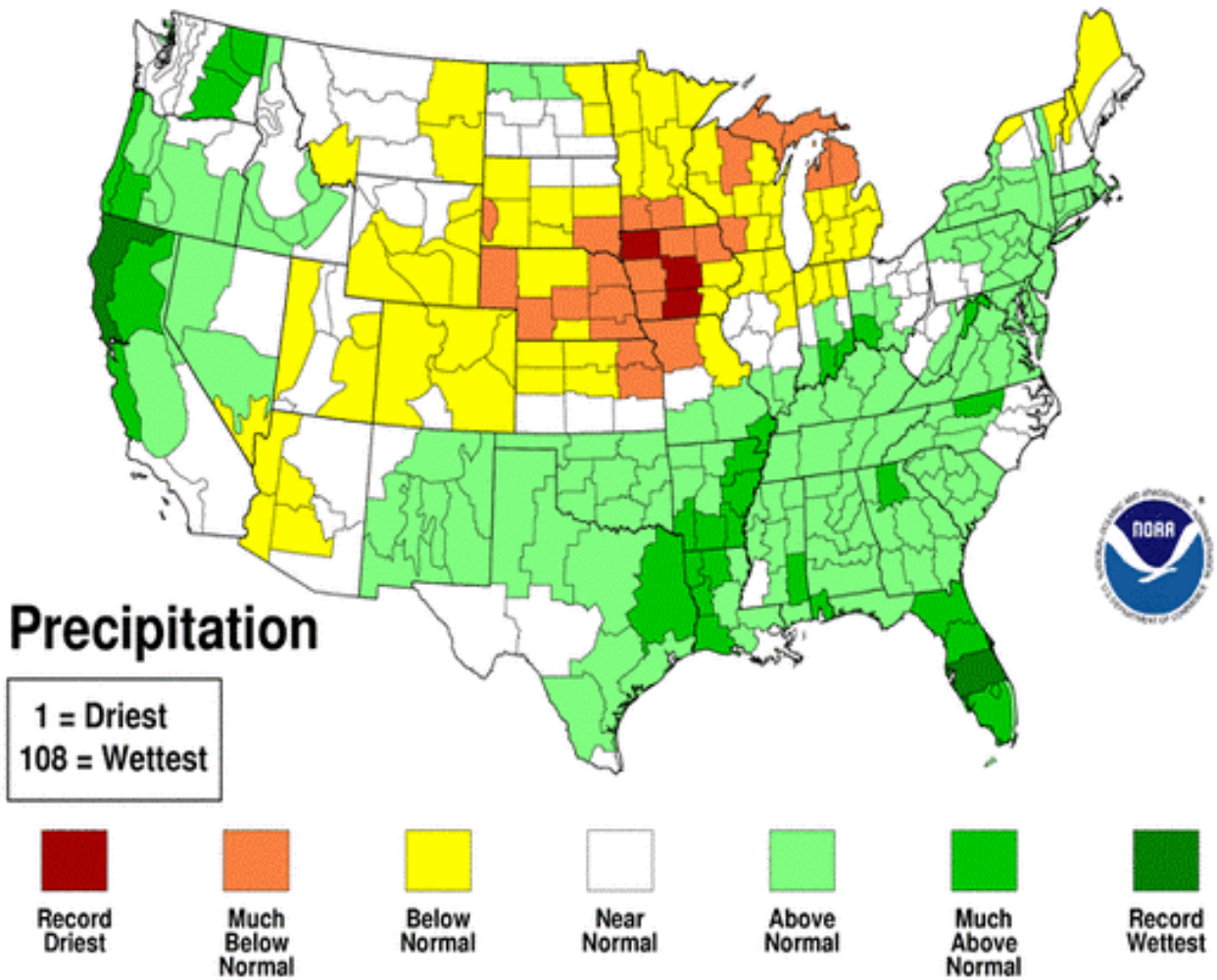


Meteorological Conditions

- December 2002 was the wettest dry season month (Nov-May) for the Upper Kissimmee basin since March 1930.
  - December Rainfall: 12.02 in.
  - Avg. December Rainfall: 2.26 in.
- December 2002 was also the second wettest month in the Upper Kissimmee since Sept. 1979 -- *wet or dry season*
  - Wettest month during that period was June 2002 at 13.89"

Dec 2002 Divisional Ranks

National Climatic Data Center/NESDIS/NOAA



General Hydrologic Conditions

Governing Board Presentation - January 9, 2003

General Hydrologic Conditions

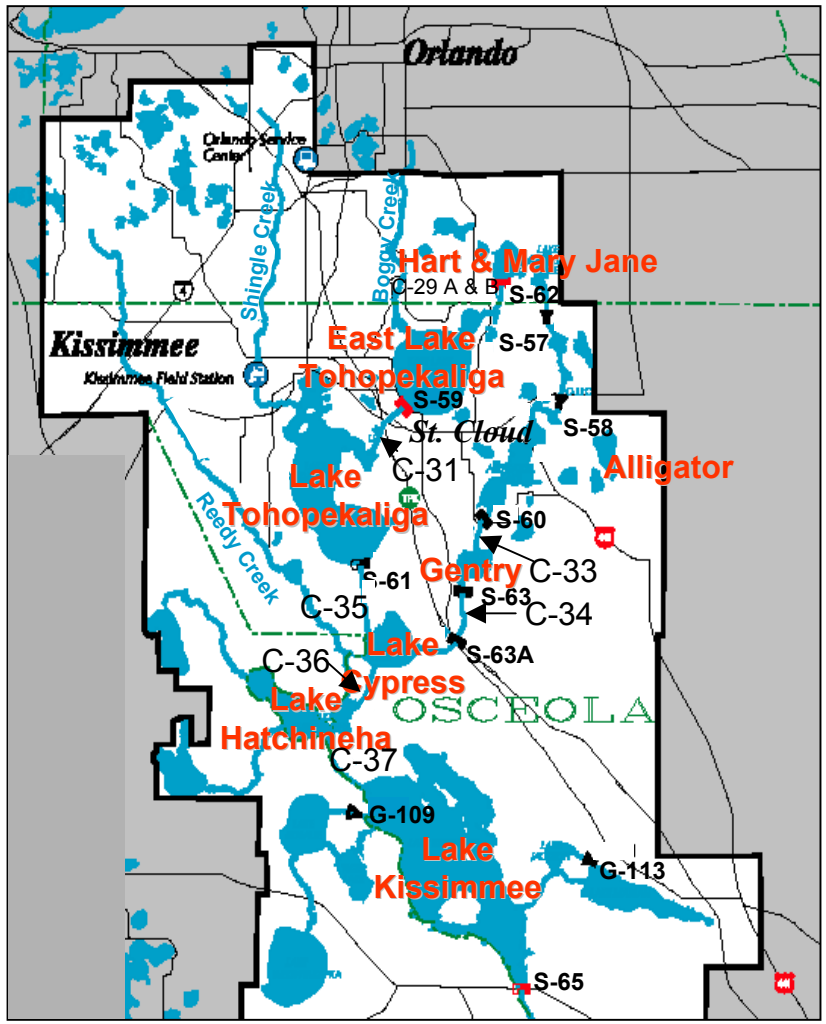
- Y **Upper Chain** - Ponding in low lying areas
- Y **Kissimmee River** - High stages & flows
- Y **Lake Okeechobee** - Above desirable stage
- G **Lake Okeechobee Agriculture**
- Y **Estuaries** - Low salinity

General Hydrologic Conditions

- **Water Conservation Area 1** - Near Sched.
- **Water Conservation Area 2** - Near Sched.
- **Water Conservation Area 3** - Near Sched.
- **ENP** - Normal seasonal conditions
- **Fl. Bay** - Normal seasonal conditions
- **Upper East Coast** - Norm. groundwater
- **Lower East Coast** - Norm. groundwater
- **Lower West Coast** - Norm. groundwater

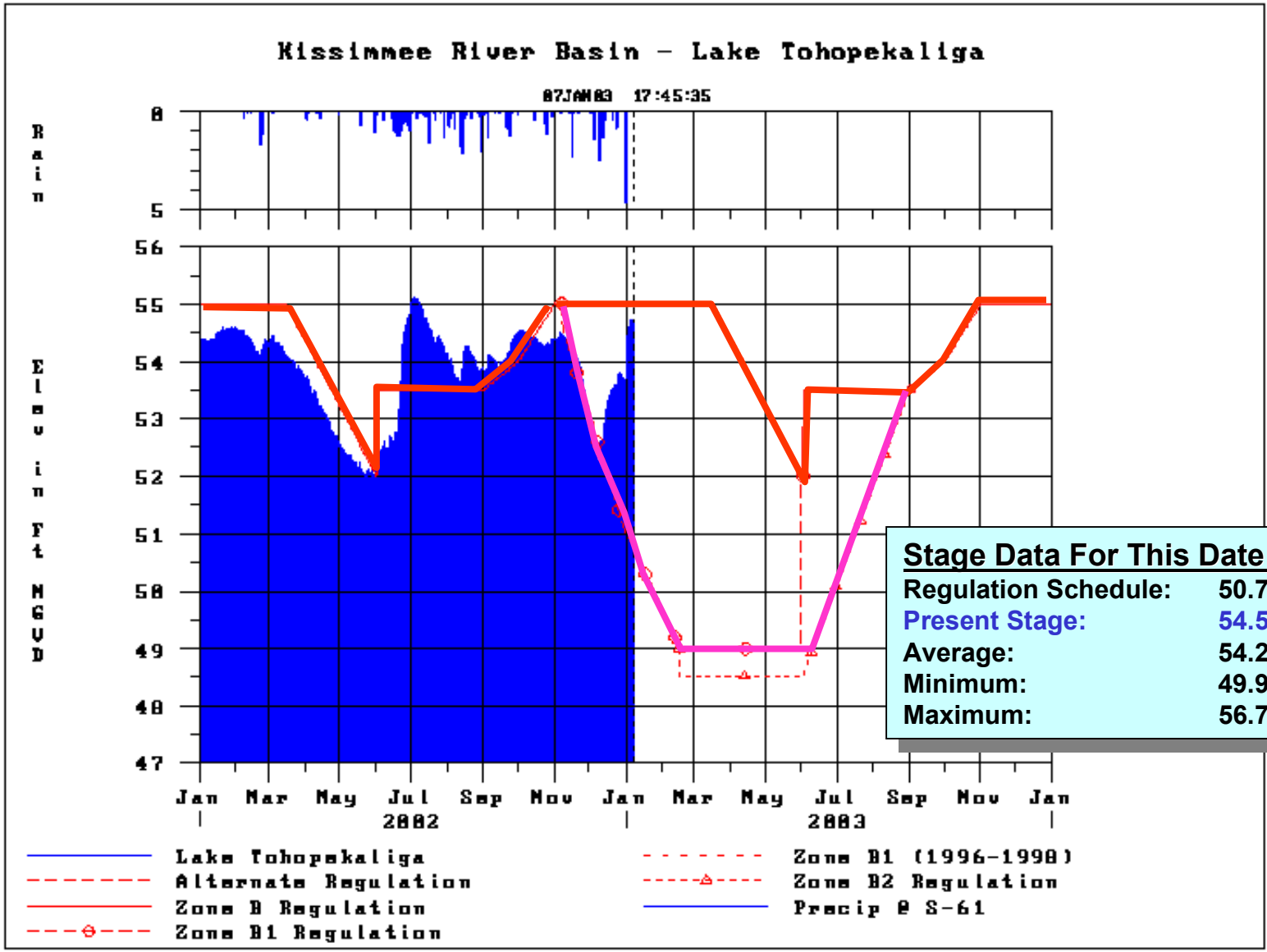
Hydrologic Conditions
Upper Kissimmee Basins

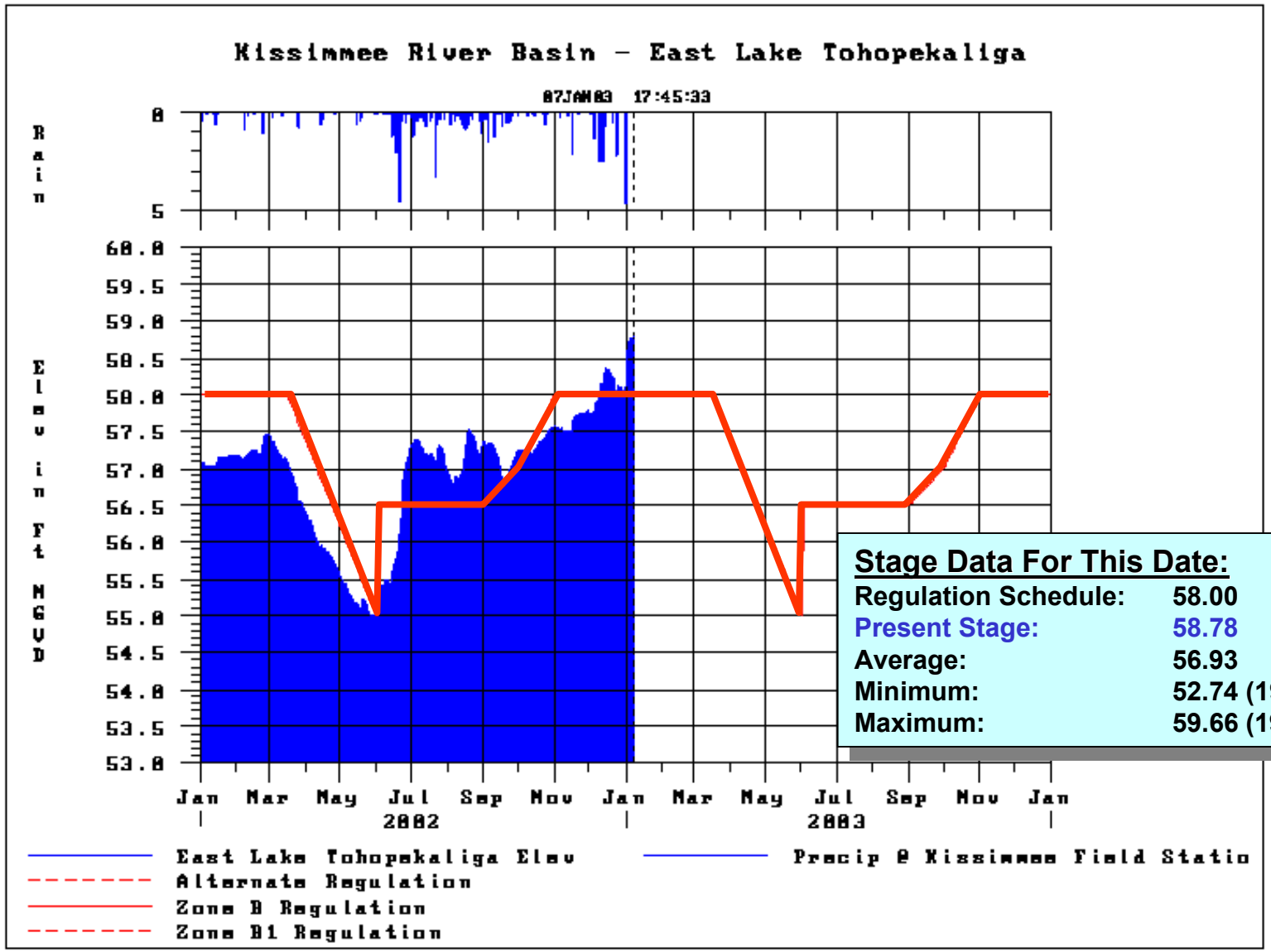
- All lakes are above their regulation schedules
  - System is “full”
  - Currently making **maximum** regulatory releases
- Lake Toho Drawdown continues
  - More above average rainfall will probably delay reaching the target low stage by Feb 15th

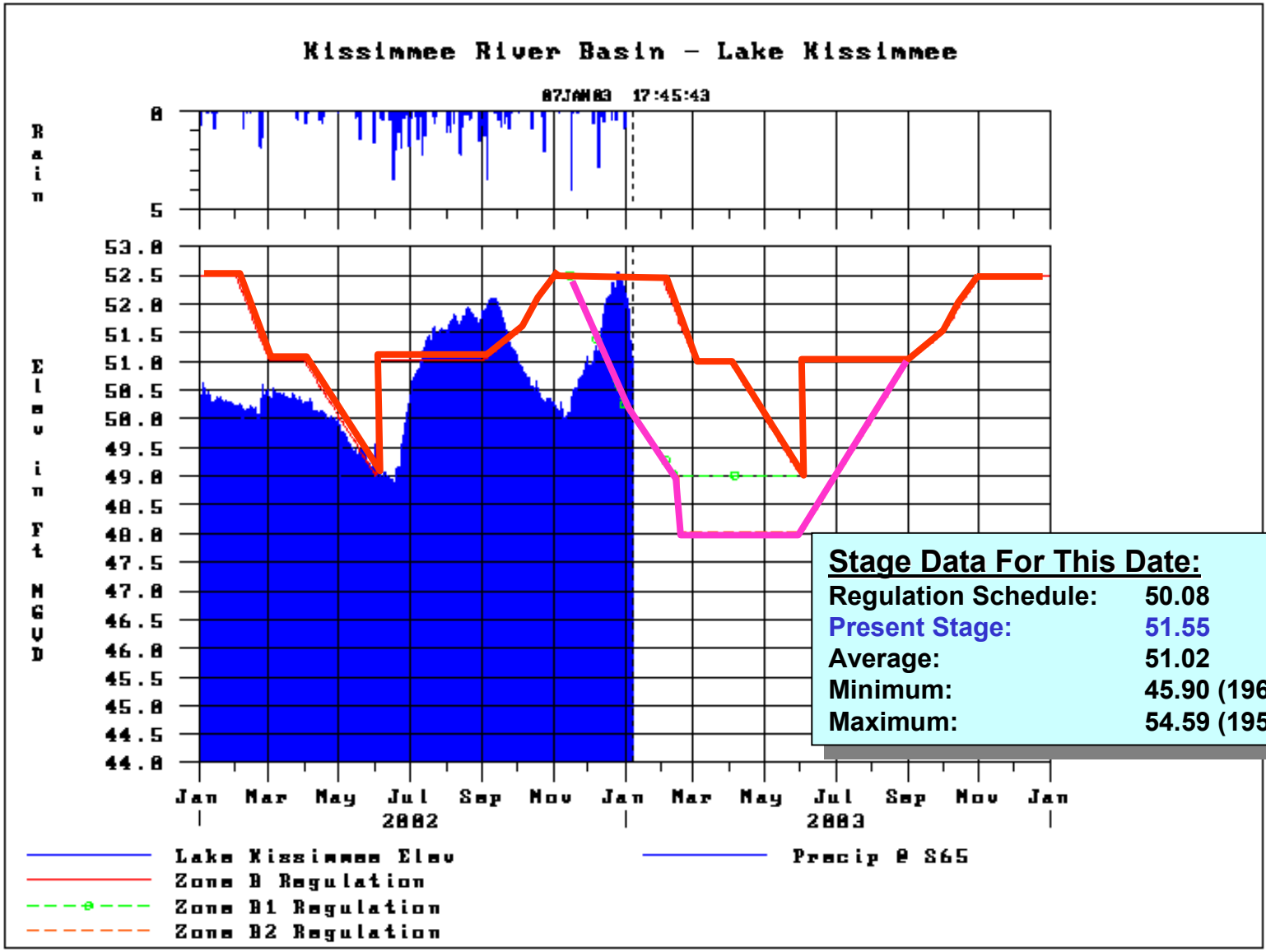


Hydrologic Conditions
Lake Toho Extreme Drawdown

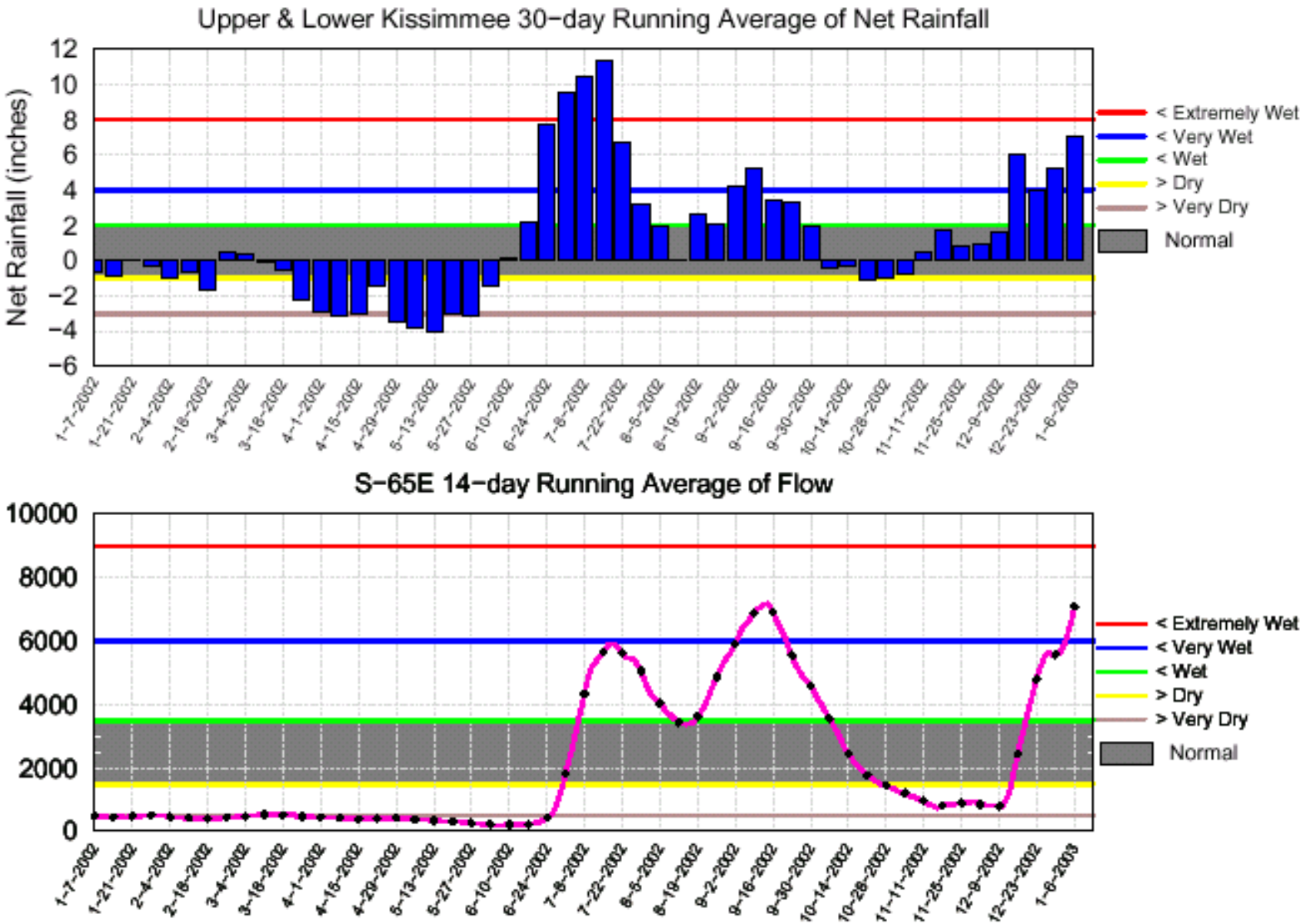
- Drawdown operations started on Nov 1, 2002
- Based on current conditions, it is estimated that the drawdown will discharge an **additional** ~100,000 ac-ft to the Kissimmee River and Lake Okeechobee
  - This additional volume translates to approximately 0.2 ft. equivalent depth in Lake Okeechobee
- More rainfall will probably delay reaching the target low stage by Feb 15th
  - It may be possible to reach the target stage by mid-March depending on rainfall
  - Operations are being coordinated with USACE & FF&WCC on a real-time basis


Kissimmee River Basin - Lake Tohopekaliga
07JAN03 17:45:35
Rain
Elev in Ft NGVD
0
5
56
55
54
53
52
51
50
49
48
47
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
Lake Tohopekaliga
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Zone B1 (1996-1998)
Zone B2 Regulation
Precip @ S-61
Stage Data For This Date:
Regulation Schedule: 50.73
Present Stage: 54.56
Average: 54.25
Minimum: 49.93 (1962)
Maximum: 56.73 (1954)


Kissimmee River Basin - East Lake Tohopekaliga
07JAN03 17:45:33
Rain
Elev in Ft NGVD
Stage Data For This Date:
Regulation Schedule: 58.00
Present Stage: 58.78
Average: 56.93
Minimum: 52.74 (1962)
Maximum: 59.66 (1954)
East Lake Tohopekaliga Elev
Precip @ Kissimmee Field Statio
Alternate Regulation
Zone B Regulation
Zone B1 Regulation


Kissimmee River Basin - Lake Kissimmee
07JAN03 17:45:43
Rain
Elev in Ft NGVD
0
5
53.0
52.5
52.0
51.5
51.0
50.5
50.0
49.5
49.0
48.5
48.0
47.5
47.0
46.5
46.0
45.5
45.0
44.5
44.0
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
Lake Kissimmee Elev
Zone B Regulation
Zone B1 Regulation
Zone B2 Regulation
Precip @ S65
Stage Data For This Date:
Regulation Schedule: 50.08
Present Stage: 51.55
Average: 51.02
Minimum: 45.90 (1962)
Maximum: 54.59 (1954)

Tributary Basin Condition Indicators as of January 6, 2003



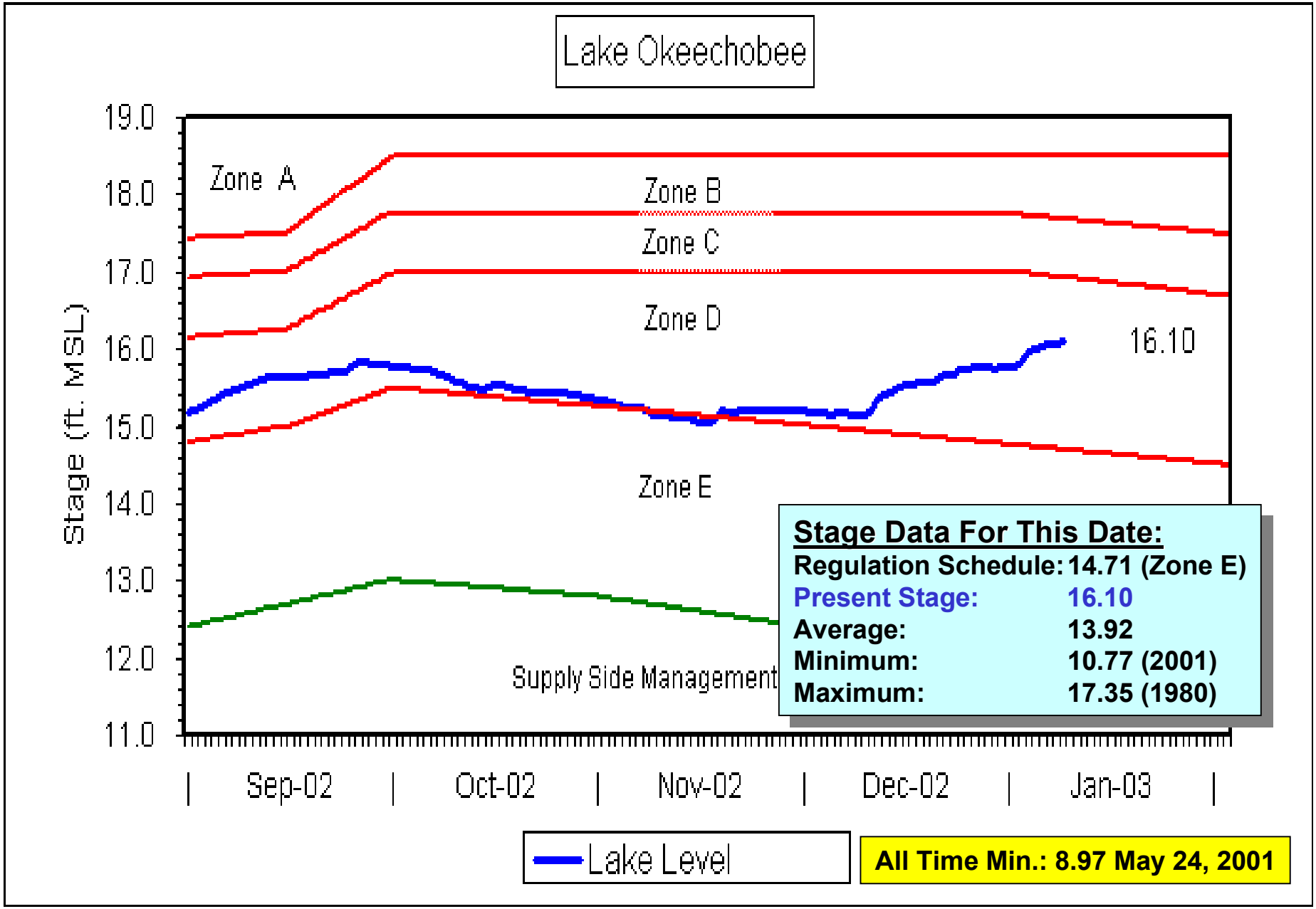

S-65C
District Stream Gaugers


HW 35.76’
TW 27.48’
4 Gates @ 6.1 Ft. ea.


Weir #1

Hydrologic Conditions
Lake Okeechobee

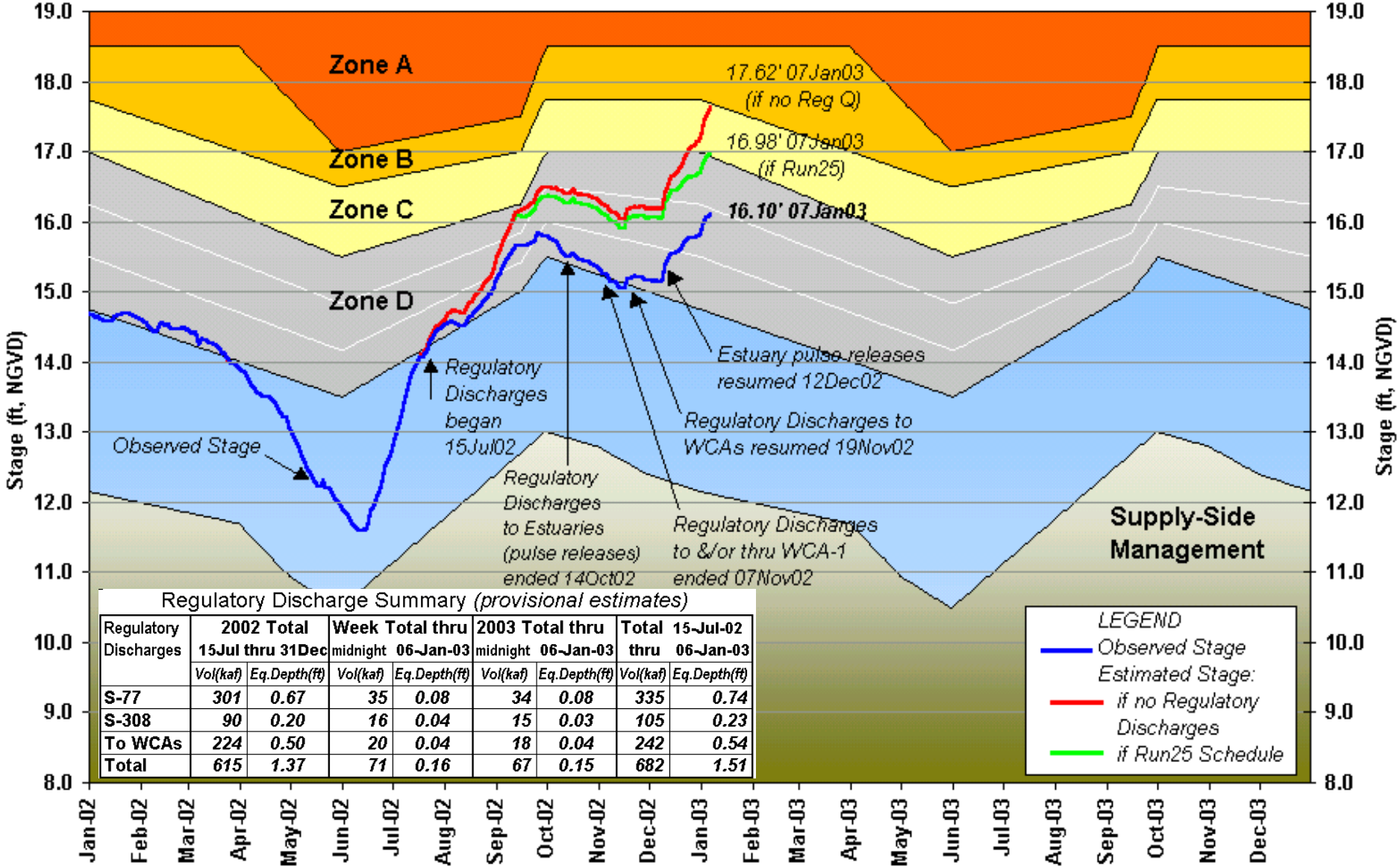
- Lake Okeechobee stages have continued to rise over the past month in response to recent heavy rainfall even with the continuation of Level II Pulse Releases
- Recent rainfall has resulted in very wet conditions in the Kissimmee River basin
- Maximum regulatory (Flood) releases from the Upper Chain of Lakes and Kissimmee River are expected to continue for another week or so depending upon rainfall


Lake Okeechobee
Stage (ft. MSL)
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
Zone A
Zone B
Zone C
Zone D
Zone E
16.10
Supply Side Management
Stage Data For This Date:
Regulation Schedule: 14.71 (Zone E)
Present Stage: 16.10
Average: 13.92
Minimum: 10.77 (2001)
Maximum: 17.35 (1980)
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Lake Level
All Time Min.: 8.97 May 24, 2001

Lake Okeechobee Current Operations

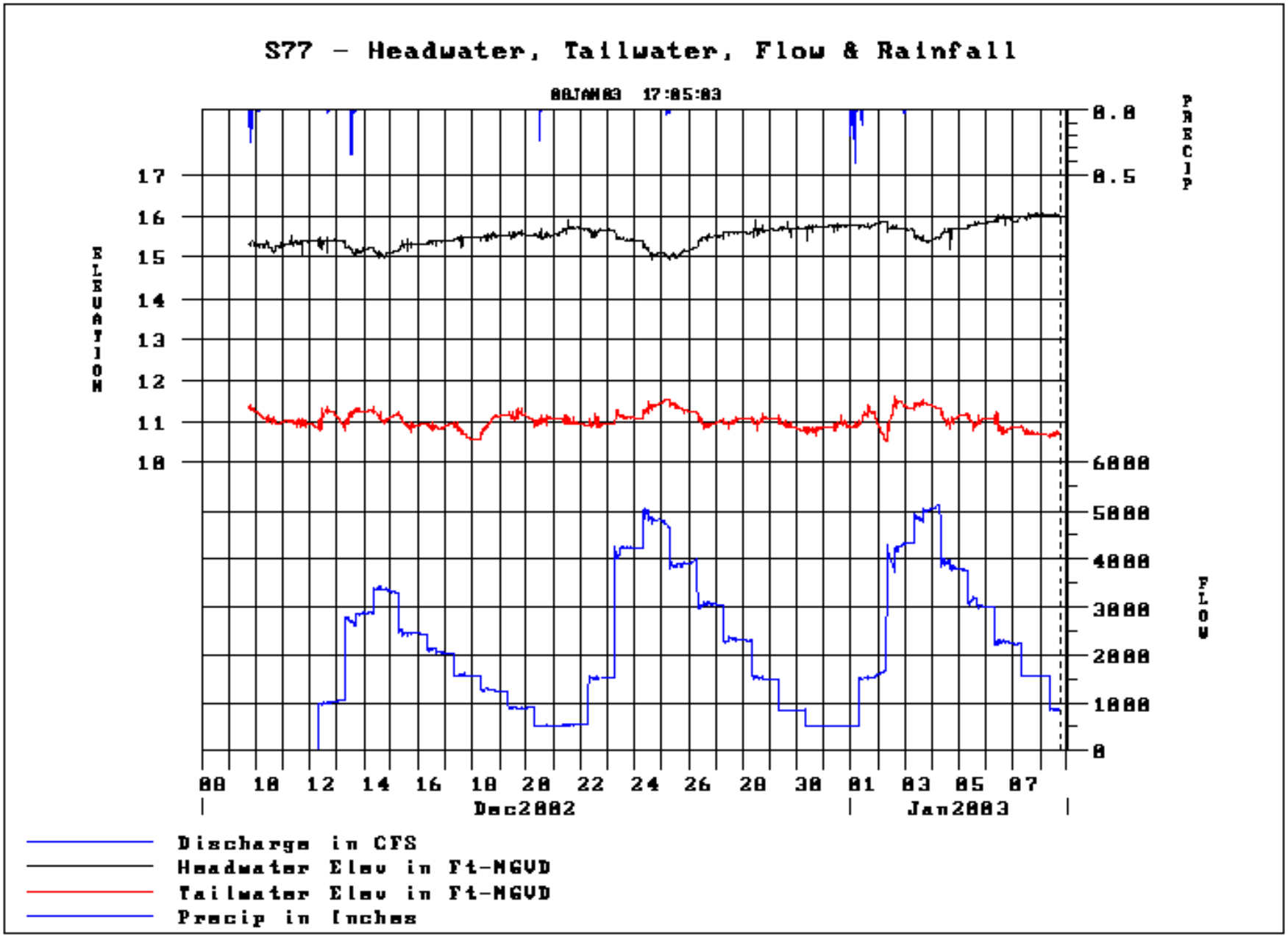
- **Regulation Schedule**
  - **Stages presently in Zone D**
  - Above normal inflows
  - Above normal rainfall
  - Normal seasonal forecast
  - Very wet multi-seasonal forecast
- Required regulatory discharge to the WCAs
- Required regulatory discharge to estuaries
  - 5th **Level II Pulse Release** initiated Jan 1st
  - 9th pulse releases since mid-July

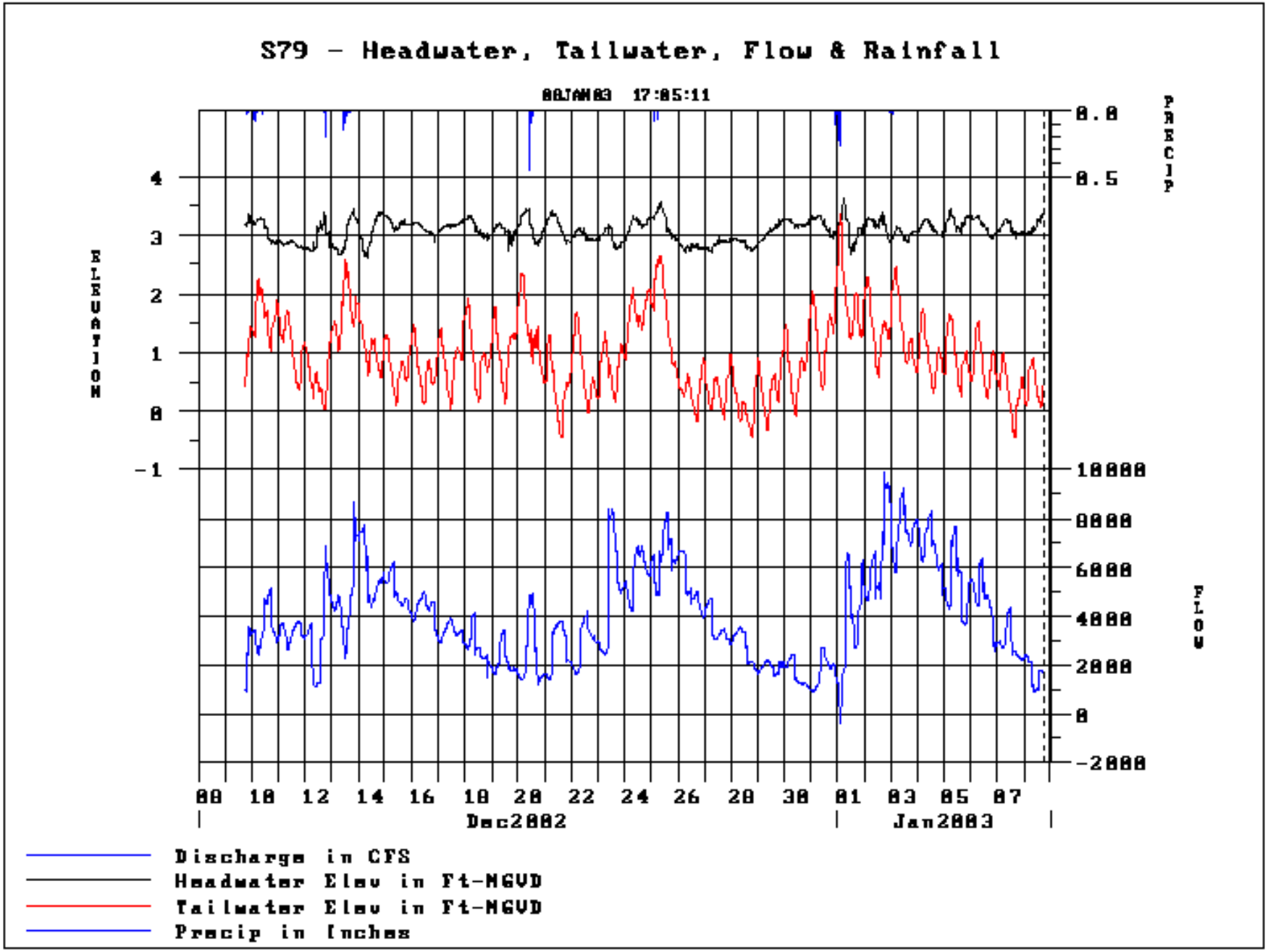
Lake Okeechobee Stage Comparison

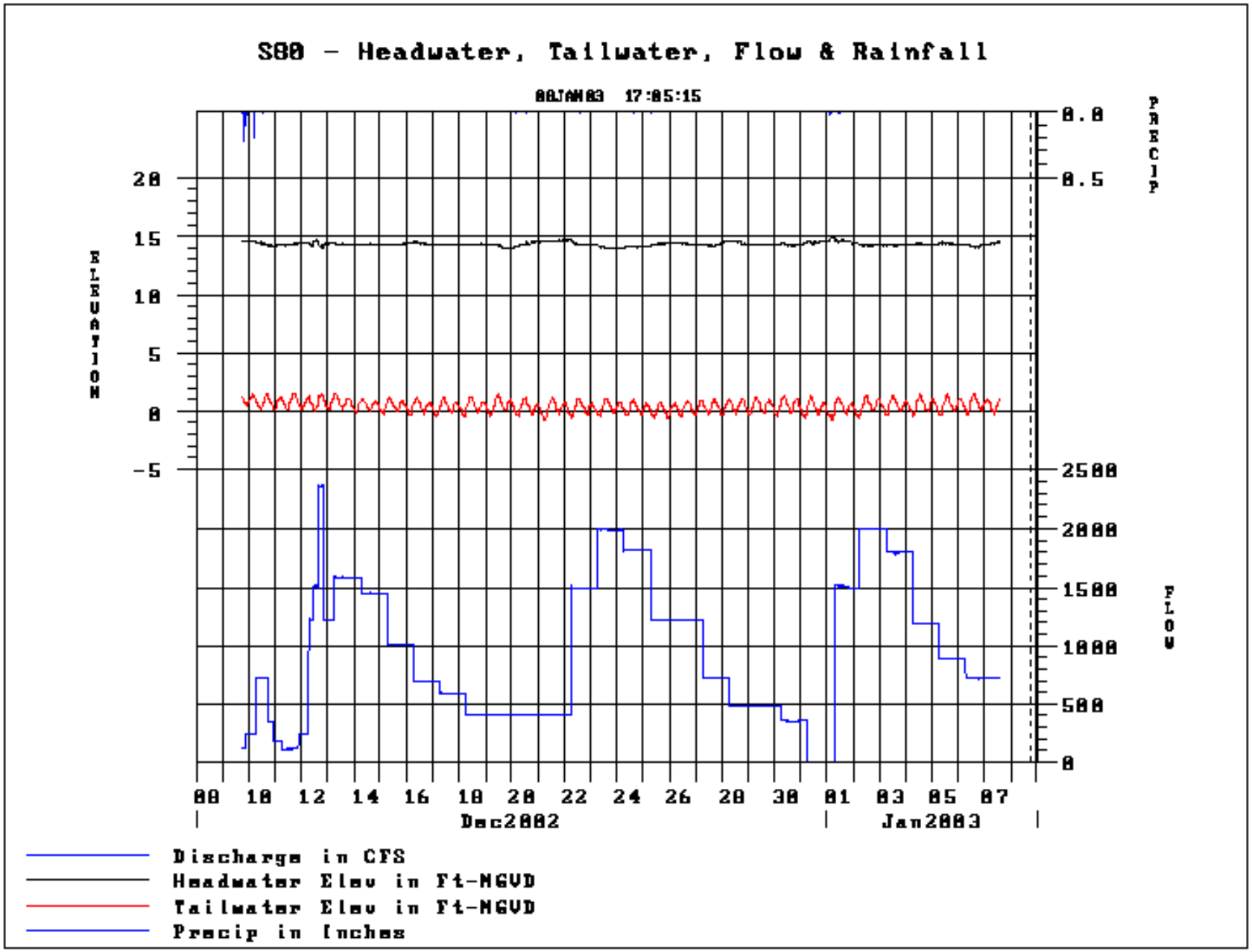


Regulatory Discharge Summary *(provisional estimates)*

Regulatory Discharges	2002 Total 15Jul thru 31Dec		Week Total thru midnight 06-Jan-03		2003 Total thru midnight 06-Jan-03		Total thru 06-Jan-03	15-Jul-02
	Vol(kaf)	Eq.Depth(ft)	Vol(kaf)	Eq.Depth(ft)	Vol(kaf)	Eq.Depth(ft)	Vol(kaf)	Eq.Depth(ft)
S-77	301	0.67	35	0.08	34	0.08	335	0.74
S-308	90	0.20	16	0.04	15	0.03	105	0.23
To WCAs	224	0.50	20	0.04	18	0.04	242	0.54
Total	615	1.37	71	0.16	67	0.15	682	1.51

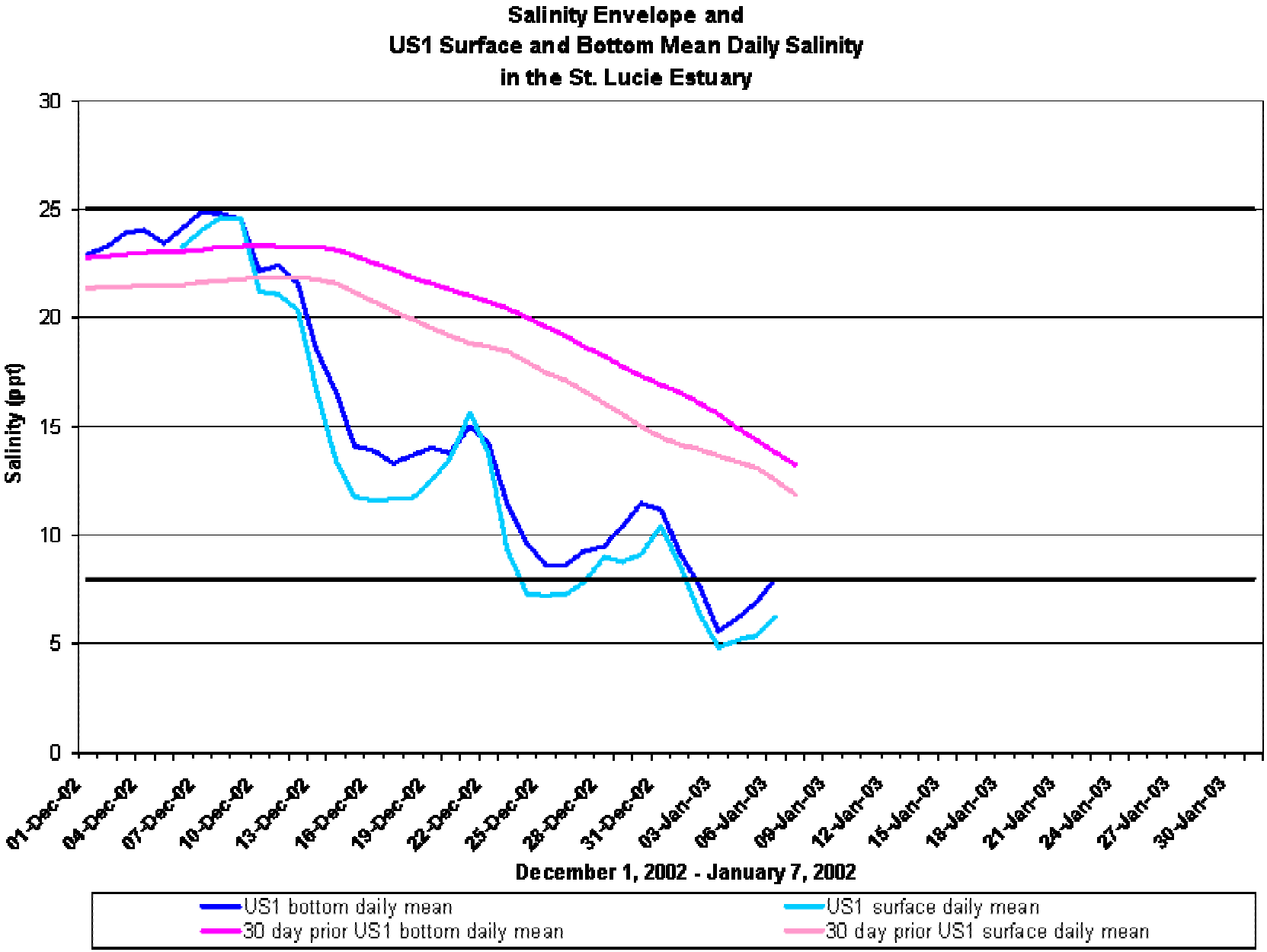

S77 - Headwater, Tailwater, Flow & Rainfall
08JAN03 17:05:03
ELEVATION
17
16
15
14
13
12
11
10
PRECIP
8.0
8.5
FLOW
6000
5000
4000
3000
2000
1000
0
00 10 12 14 16 18 20 22 24 26 28 30 01 03 05 07
Dec2002
Jan2003
Discharge in CFS
Headwater Elev in Ft-NGVD
Tailwater Elev in Ft-NGVD
Precip in Inches

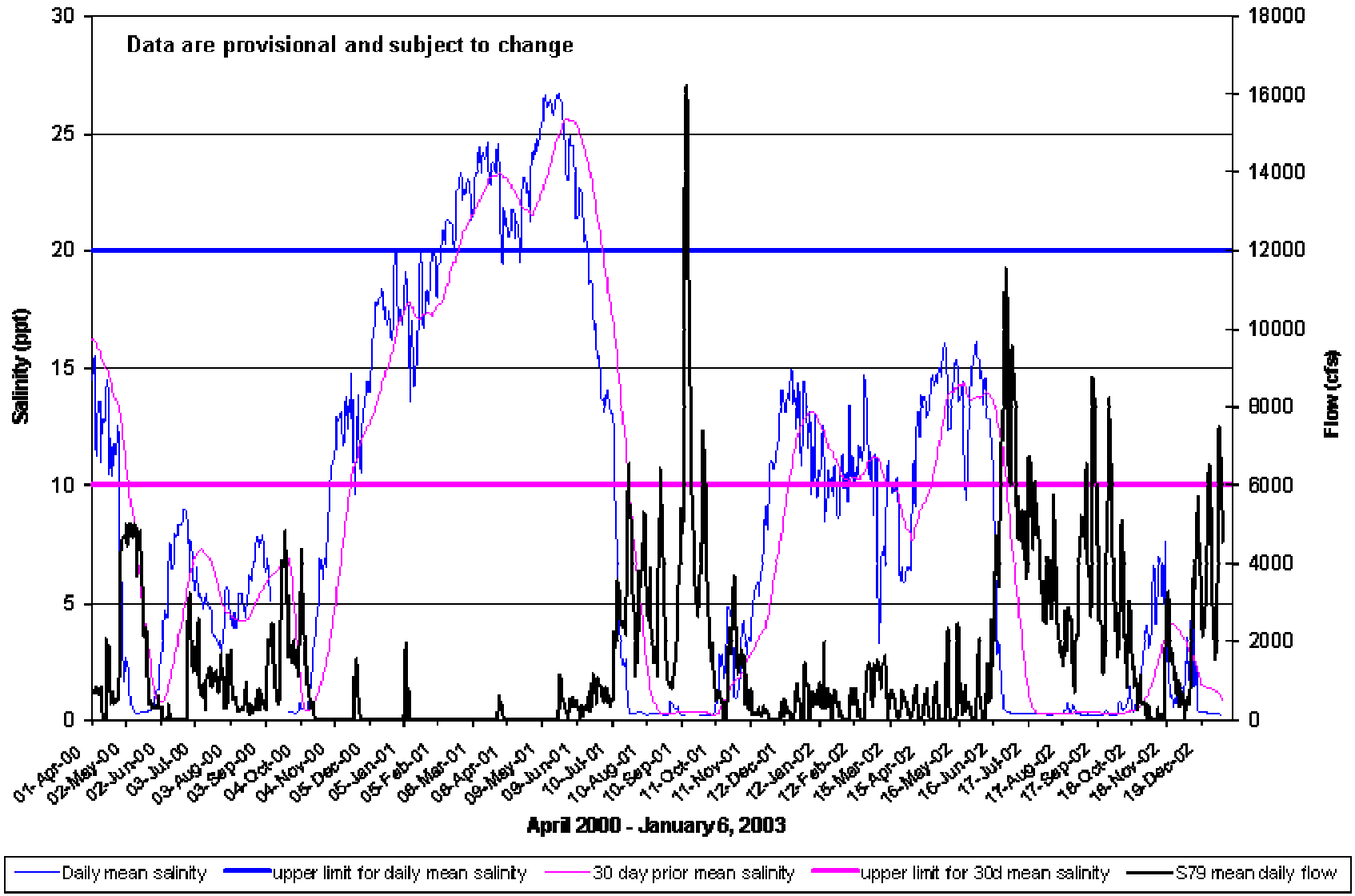

S79 - Headwater, Tailwater, Flow & Rainfall
08JAN03 17:05:11
ELEVATION
4
3
2
1
0
-1
PRECIP
0.0
0.5
FLOW
10000
8000
6000
4000
2000
0
-2000
08 10 12 14 16 18 20 22 24 26 28 30 01 03 05 07
Dec2002
Jan2003
Discharge in CFS
Headwater Elev in Ft-NGVD
Tailwater Elev in Ft-NGVD
Precip in Inches


S80 - Headwater, Tailwater, Flow & Rainfall
08JAN03 17:05:15
ELEVATION
20
15
10
5
0
-5
PRECIP
0.0
0.5
FLOW
2500
2000
1500
1000
500
0
08 10 12 14 16 18 20 22 24 26 28 30 01 03 05 07
Dec2002
Jan2003
Discharge in CFS
Headwater Elev in Ft-NGVD
Tailwater Elev in Ft-NGVD
Precip in Inches

Hydrologic Conditions - Estuaries

- St. Lucie
  - Over the past week, ~90% of discharges to the estuary have been from Lake Okeechobee
  - Salinity values at the Roosevelt Bridge are low but just within the preferred range
  - Salinity values at A-1-A Bridge…
    - Surface: Within the preferred range
    - Bottom: Below the preferred range
- Caloosahatchee
  - Over the past week, ~70% of discharges to the estuary have been from Lake Okeechobee
  - Salinity values in the upper estuary are within the preferred range for freshwater submerged plants
  - Salinity values in the mid to lower estuary are below the preferred range


Salinity Envelope and
US1 Surface and Bottom Mean Daily Salinity
in the St. Lucie Estuary
Salinity (ppt)
30
25
20
15
10
5
0
01-Dec-02
04-Dec-02
07-Dec-02
10-Dec-02
13-Dec-02
16-Dec-02
19-Dec-02
22-Dec-02
25-Dec-02
28-Dec-02
31-Dec-02
03-Jan-03
06-Jan-03
09-Jan-03
12-Jan-03
15-Jan-03
18-Jan-03
21-Jan-03
24-Jan-03
27-Jan-03
30-Jan-03
December 1, 2002 - January 7, 2002
US1 bottom daily mean
US1 surface daily mean
30 day prior US1 bottom daily mean
30 day prior US1 surface daily mean

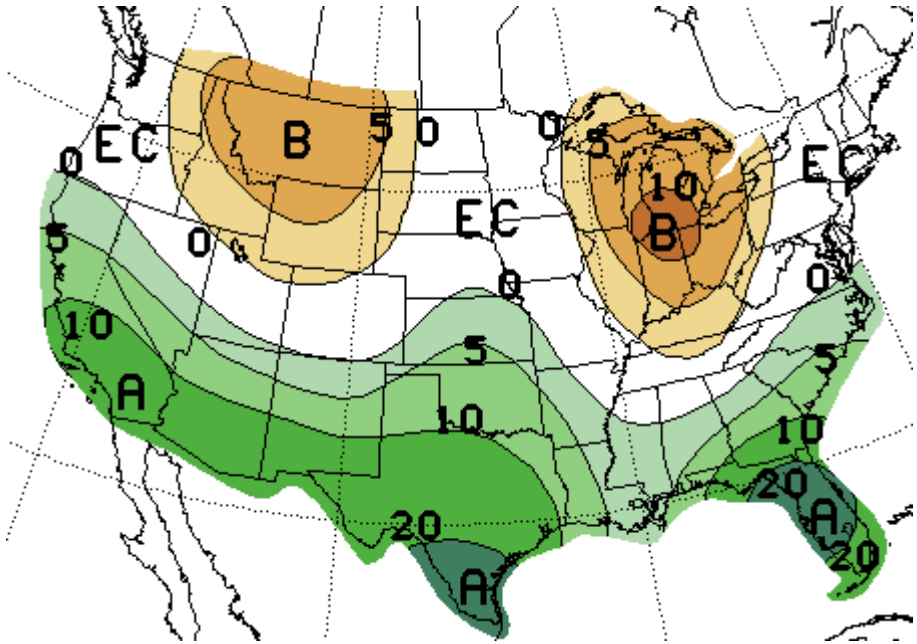

Salinity at City of Ft. Myers Yacht Basin and Upper Limit Exceedance
of Caloosahatchee MFL and Mean Daily Flow from S79
Data are provisional and subject to change
Salinity (ppt)
Flow (cfs)
0
5
10
15
20
25
30
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
01-Apr-00
02-May-00
02-Jun-00
03-Jul-00
03-Aug-00
03-Sep-00
04-Oct-00
04-Nov-00
05-Dec-00
05-Jan-01
05-Feb-01
06-Mar-01
06-Apr-01
06-May-01
09-Jun-01
10-Jul-01
10-Aug-01
10-Sep-01
11-Oct-01
11-Nov-01
12-Dec-01
12-Jan-02
12-Feb-02
15-Mar-02
15-Apr-02
16-May-02
16-Jun-02
17-Jul-02
17-Aug-02
17-Sep-02
18-Oct-02
18-Nov-02
19-Dec-02
April 2000 - January 6, 2003
Daily mean salinity
upper limit for daily mean salinity
30 day prior mean salinity
upper limit for 30d mean salinity
S79 mean daily flow

Climate Outlook

Governing Board Presentation - January 9, 2003

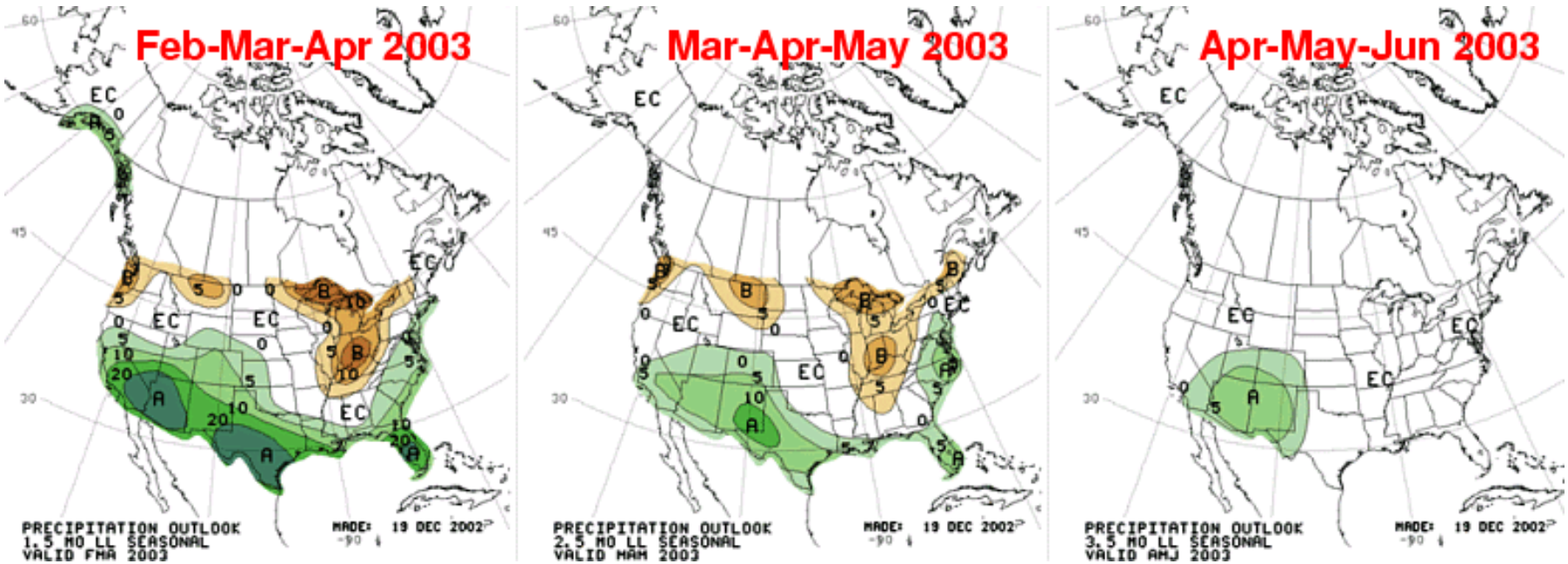
Seasonal Climatic Outlook

- CPC reports that January 2003 has an increased probability for above average precipitation north of Lake Okeechobee



Multi-Seasonal Climatic Outlook

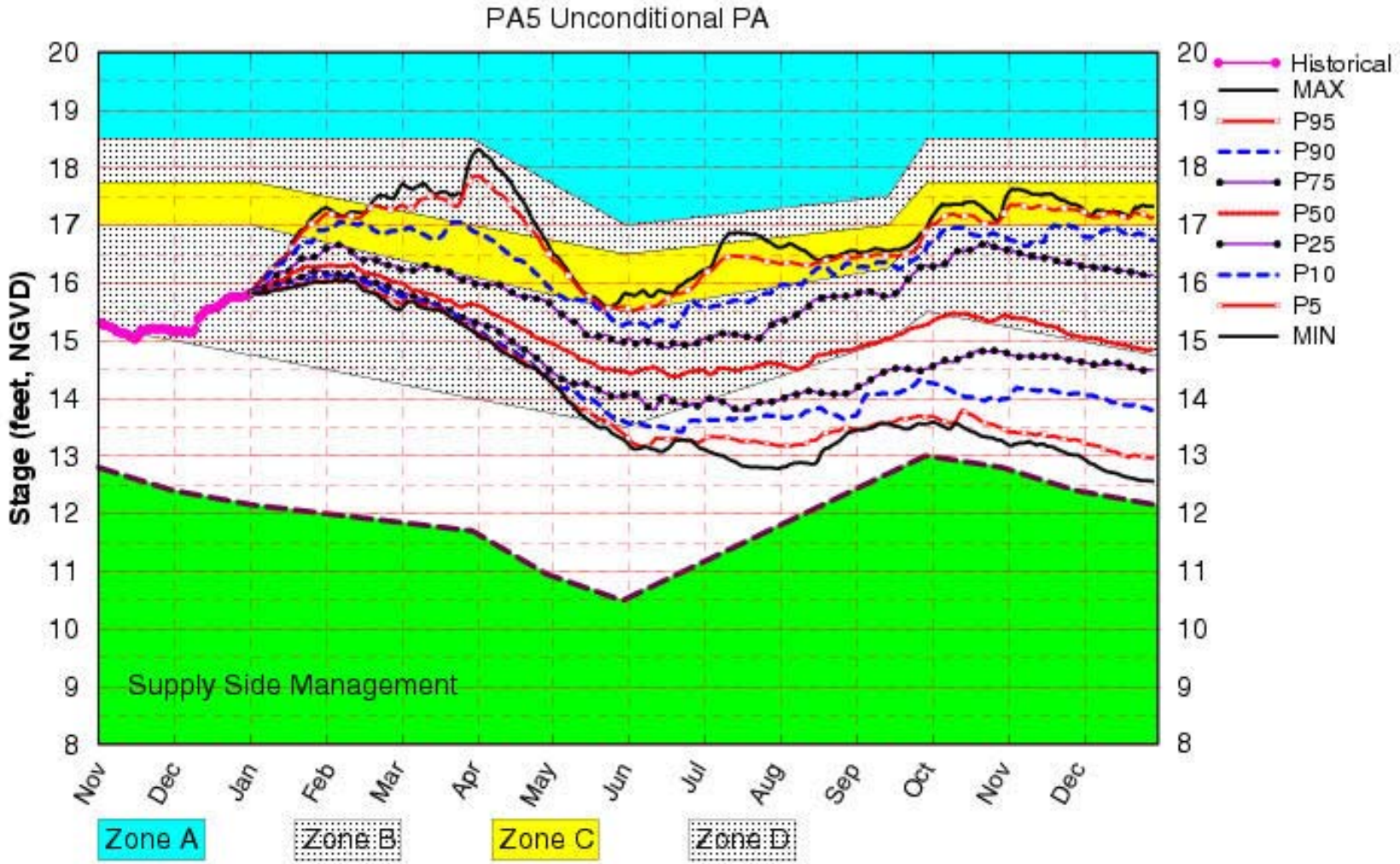
- CPC indicates that there continues to be a higher probability of above average rainfall through March-April



Hydrologic Outlook

Governing Board Presentation - January 9, 2003

Lake Okeechobee SFWMM Jan 2003 Position Analysis

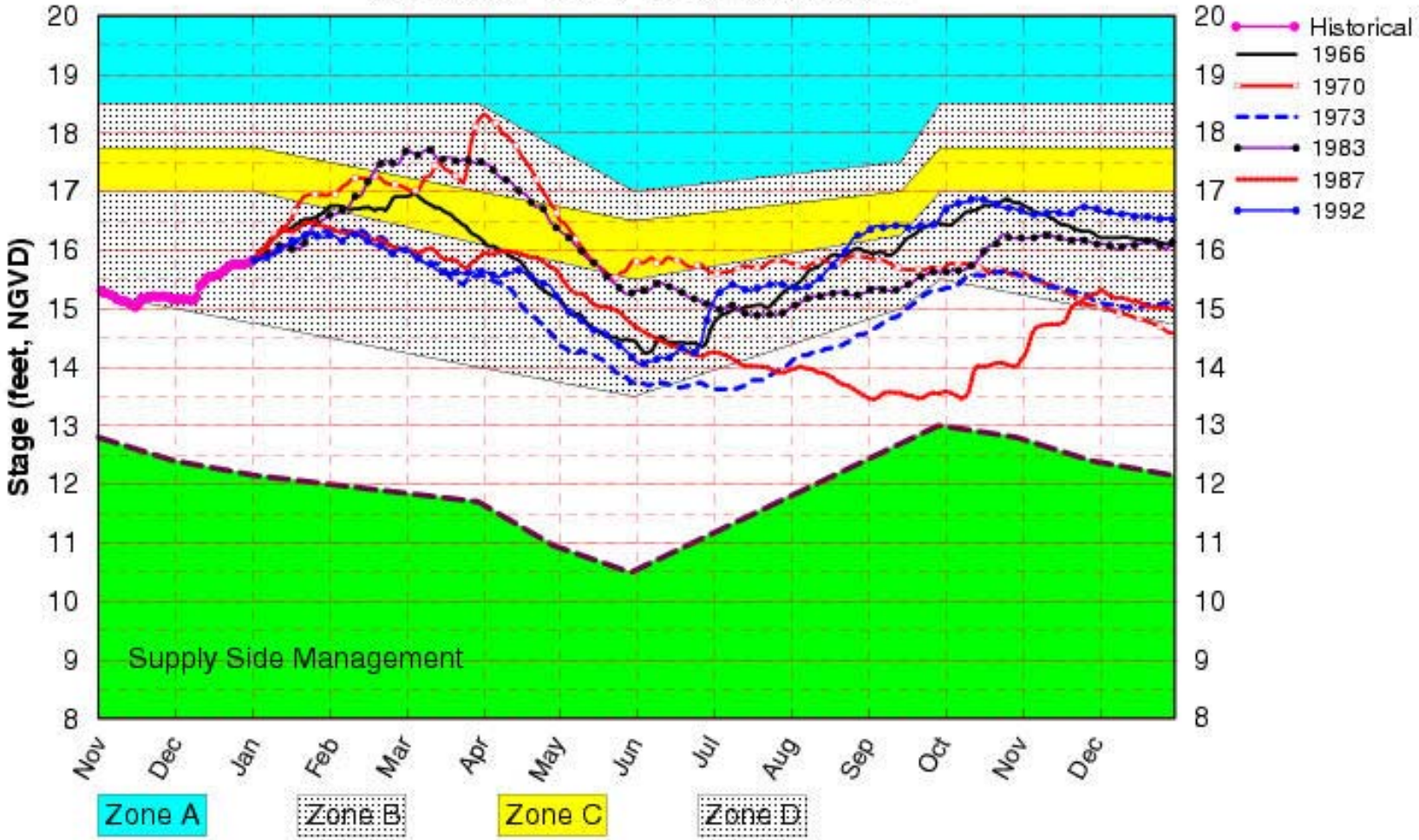


(See assumptions @ http://www.sfwmd.gov/org/pld/hsm/sfwmm_pa.html)

Wed Jan 8 18:47:39 2003

Lake Okeechobee SFWMM Jan 2003 Position Analysis

PA5 El Nino Years Plot Unconditional PA



(See assumptions @ http://www.sfwmd.gov/org/pld/hsm/sfwmm_pa.html)

Wed Jan 8 18:48:33 2003

Operations Outlook
Lake Okeechobee Position Analysis

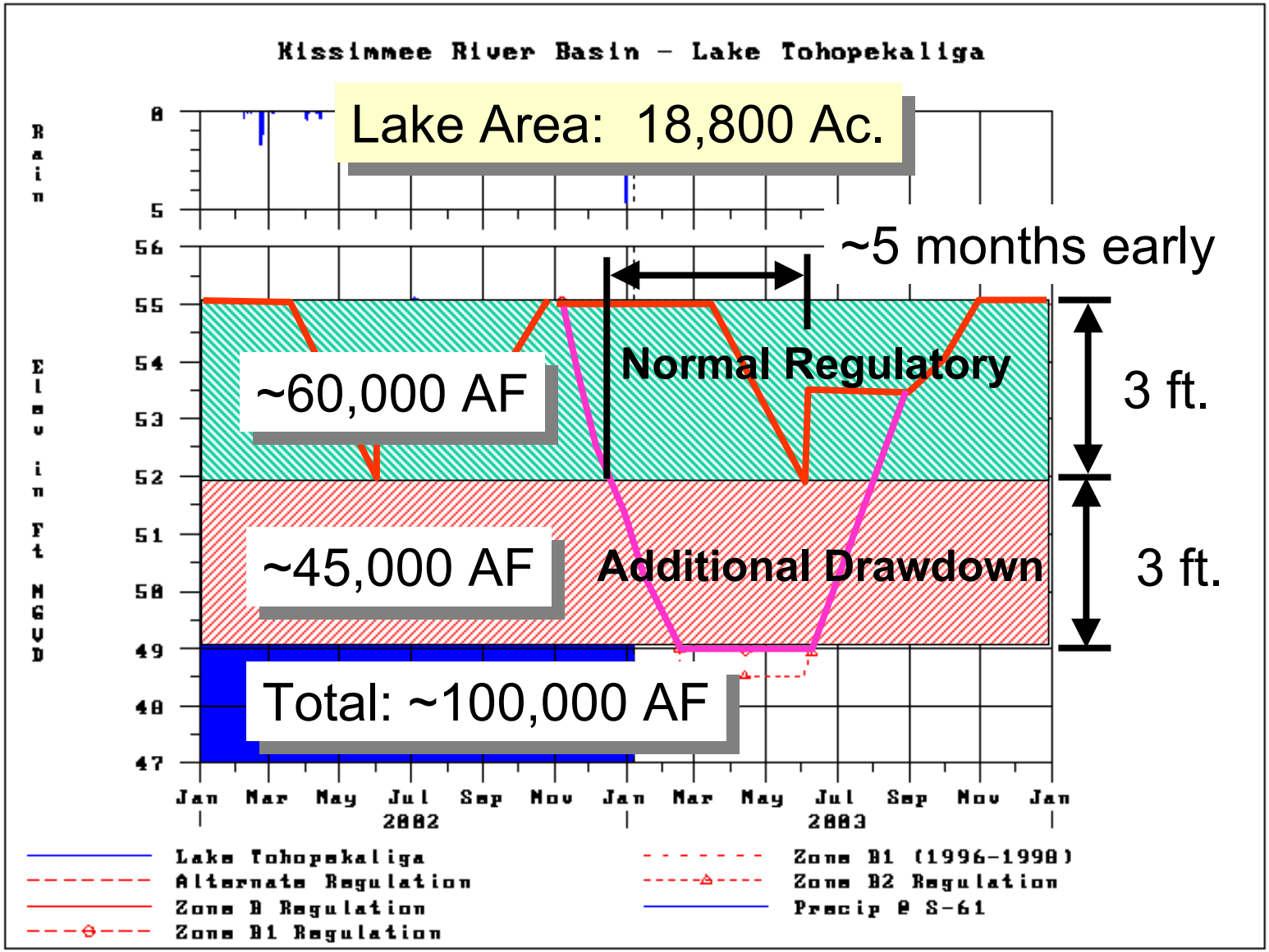
- 100% chance of being in Zone D or higher through the remainder of this dry season
- 25% chance of Lake Okeechobee stages rising into Zone C in February
- Looking at El Nino Years…
  - In All El Nino years, stages remain in Zone D through the dry season
  - In 3 of the 6 El Nino years, stages rise into Zone C in February or March
  - In 2 of the 6 El Nino years, stages rise into Zone B between late February and early March

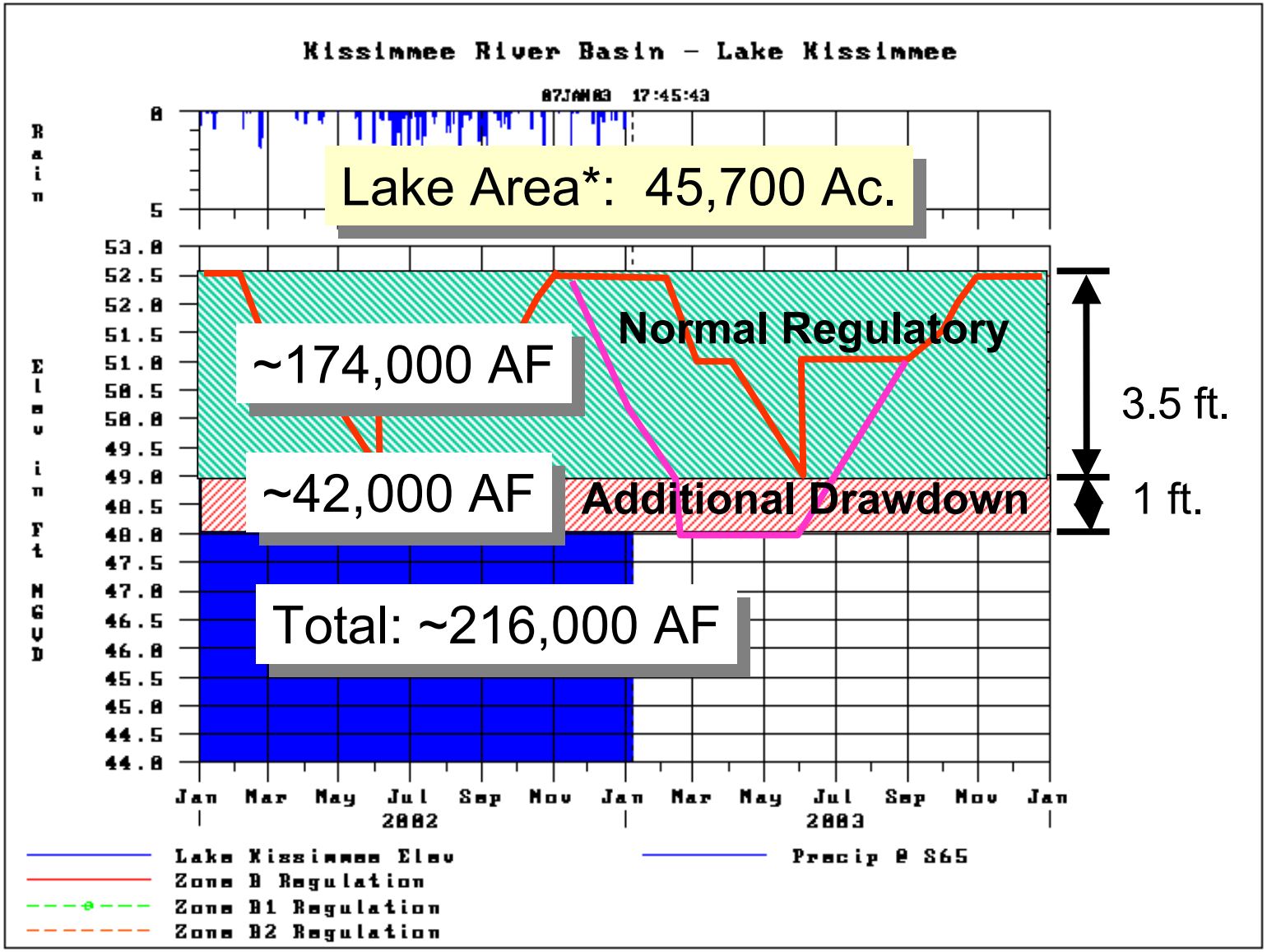
Lake Toho Extreme Drawdown

- Spatial Comparison
  - The Upper Chain of Lakes drainage basin is about 2 million acres in area
    - It received about 12” of rainfall in December
      - Hurricane Irene dropped similar volumes in 24-36 hours in Miami-Dade County -- Severe flooding
  - The lakes affected by the drawdown are Toho, Kissimmee and Hatchineha
    - Total Area of lakes: ~64,000 ac.
  - Lake Okeechobee Area: ~450,000 ac.
  - The Drawdown lakes are ~14% the area of Lake Okeechobee

Lake Toho Extreme Drawdown

- Drawdown operations started on Nov 1, 2002
- Based on current conditions, it is estimated that the drawdown will discharge and **additional** ~100,000 ac-ft to the Kissimmee River and Lake Okeechobee
  - This additional volume translates to approximately 0.2 ft. equivalent depth in Lake Okeechobee
- More rainfall will probably delay reaching the target low stage by Feb 15th
  - It may be possible to reach the target stage by mid-March depending on rainfall
  - Operations are being coordinated with USACE & FF&WCC on a real-time basis


Kissimmee River Basin - Lake Tohopekaliga
Lake Area: 18,800 Ac.
~5 months early
Normal Regulatory
~60,000 AF
3 ft.
~45,000 AF
Additional Drawdown
3 ft.
Total: ~100,000 AF
Rain
Elev in Ft NGVD
0
5
56
55
54
53
52
51
50
49
48
47
Jan Mar May Jul Sep Nov Jan Mar May Jul Sep Nov Jan
2002
2003
Lake Tohopekaliga
Alternate Regulation
Zone B Regulation
Zone B1 Regulation
Zone B1 (1996-1998)
Zone B2 Regulation
Precip @ S-61



* incl. lakes Hatch & Cypress

Lake Toho Extreme Drawdown

- Illustrate the relationship of the Drawdown operations to normal operations of the Kissimmee Upper Chain of Lakes
- “Dead-Storage” Calculations
  - Does not consider current continuing inflows
  - Does not consider future rainfall inputs

Lake Toho Extreme Drawdown

- Normal Regulation Disch. Vol: 234,000 AF
- Additional Drawdown Vol: 87,000 AF

- Total: 321,000 AF

- Additional Drawdown Vol: ~ ***0.2 ft on L. Okee***
- Total Drawdown + Reg Vol: ~ 0.7 ft. on L. Okee

Lake Toho Extreme Drawdown

- The volume of additional water from the Toho Drawdown is roughly equivalent to *one Level 3 Pulse to the estuary*
- If Lake Okeechobee does not rise into Zone C … (and there's a 75% chance that it will not)…
- …We anticipate that 14 pulses will be required through the remainder of the dry season

Lake Toho Extreme Drawdown

- We estimate that the target stages for the Drawdown can be reached during March
  - Assuming moderate El Nino rainfall
- FF&WCC has indicated that they could accomplish the goals of the project under that scenario

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